

DRAW GREEN

Dart Aerospace Ltd.

Date: Friday, 21/11/2008 11:17:17 AM
User: Linda Lacelle

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : SKID TUBE ASSEMBLY
Job Number : 43666A	
Estimate Number : 10023	
P.O. Number :	Part Number : D205634041
This Issue : 21/11/2008 S.O. No. :	Drawing Number : D2580 REV D
Prsht Rev. : NC	Project Number : N/A
First Issue : / / Type : SKIDTUBES	Drawing Revision : D
Previous Run : 43585	Material :
Written By :	Due Date : 05/12/2008 Qty: 1 Um: Each
Checked & Approved By :	
Comment : Est Rev: N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ	
Est Rev: O 06.02.28 Added paperwork EC	
Est Rev: P 07-07-09 SS Wearplates & Gaskets JLM	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
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Comment: DOCUMENT CONTROL

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

N/A

2.0	D25001190	Ext'n -I' Beam Tube 4"
-----	-----------	------------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2500-1-190	Skid Tube Extrusion	<i>B37544</i>

BE 08/11/27

3.0	D2596	Web, 205 Skidtube
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2596	205 Web	<i>B43374</i>

BE 08/11/27

4.0	SKIDTUBES 1	SKIDTUBESS RESOURCE 1
-----	-------------	-----------------------



Comment: LANDING GEAR RESOURCE 1

1- Inspect mat'l D2500-1-190 for damage

2-Cut D2500-1-190 per Dwg D2580 if necessary Deburr ends

3-Acid etch and Alodine tube per QSI 005 4.1

3 BE 08/11/27

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 21/11/2008 11:17:17 AM
User: Linda Lacelle

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

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Job Number: 43666A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

DP

8-11-27

6.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes using drill jig DT 8149(Do not use cutting fluid)

2-Open holes to 0.500" as per Dwg D2580without cutting fluid

3-Countersink holes as per Dwg D2580without cutting fluid

4-Deburr and blow out all chips from inside of tube

5-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting.

Pick:

Qty Part Number Description Batch

A/R Sikaflex-291

Sikaflex expire date: 9/7/11

Start Time: 9:45

Date: 08/11/27

Fin Time: _____ Date: _____

3E 08/11/27

7.0

BENDING

BENDING MACHINE - SKIDTUBES



Comment: BENDING MACHINE

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

JD 8-11-28 / AWM

8.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Deburr ends

2-Prepare tube for welding, remove alodine as required.

JD 8-12-1

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng				

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Date: Friday, 21/11/2008 11:17:18 AM
User: Linda Lacelle

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

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Job Number: 43666A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

0812010

10.0

D25763

Step (maching detail)



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
1	D2576-3	Step	BE 08/12/01

BE 08/12/01

11.0

D2579

Crossbolt Spacer



Comment: Qty.: 20.0000 Each(s)/Unit Total : 20.0000 Each(s)

Pick:

Qty	Part Number	Description	Batch
20	D2579	Spacers	BE 08/12/01

BE 08/12/01

12.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1

2-Weld step D2576 as per Dwg. D2580 and QSI 004.

A/R

Aluminum Rod

M109813

BE 08/12/01

3-Weld crossbolt spacers D2579 as per Dwg. D2580 and QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R

Aluminum Rod

M109813

BE 08/12/01

4-Grind welds as per Dwg D2580 Grind flush ridge made from bending

5-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Deburr

6-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Deburr holes

7-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Deburr

8-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

JB 8-12-a

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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Process Sheet

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Job Number: 43666A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

QC10

VISUAL INSPECTION OF GROUND WELDS



DBS

Comment: VISUAL INSPECTION OF GROUND WELDS

08/12/02

14.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

08/12/02

15.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1
Pressure wash as per QSI 005

U

08-12-02

(X)

16.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING
Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

see attachment 08-12-02

M104476

DRAB Green

START TIME:

12:50

OVEN TEMPERATURE:

320 OF

FINISH TIME:

1:20

M-H

08/12/02

17.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

08-12-03

(X)

18.0

D2855

Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
Cap

→

REMOVE ONE FROM STOCK, BUFF LIGHTLY
AND REPAINT OLIVE DRAB GREEN

CAP Batch: *B42343*

M104476

M-H

08/12/02

(X)

19.0

AN35A

Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
Bolt

Batch: *M100108*

U

08-12-02

(X)

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B		Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng				
8/12/02	130	Found a welding pin hole in 16H hole from eff. weld pin hole is on inside of counter bore. Not necessary		Fill hole with epoxy by per ASZ 004. 8/23				

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Job Number: 43666A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

20.0

AN960JD10L

Washer



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
Washer

Batch: M105793

JW

21.0

ALST71032130

Insert



Comment: Qty.: 50.0000 Each(s)/Unit Total: 50.0000 Each(s)
Insert

Batch: M105819

JW

*

22.0

AN3C4A

BOLT



Comment: Qty.: 50.0000 Each(s)/Unit Total: 50.0000 Each(s)
BOLT

Batch: (42x) M1109798 / (8x) M110002 JW

23.0

AN960C10L

washer



Comment: Qty.: 50.0000 Each(s)/Unit Total: 50.0000 Each(s)
washer

Batch: M1109798

JW

24.0

D356613

Gasket



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
GASKET

Batch: B412417

JW

25.0

D35665

Gasket



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
GASKET

Batch: B437410

JW

26.0

D35661

Gasket



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
GASKET

Batch: (1x) B413264 / (1x) B43709 JW 08-12 x 02 (X)

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Job Number: 43666A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

27.0

D356413

Wearshoe



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

WEARSHOE

Batch: B42257

JA

28.0

D356411

Wearshoe



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

WEARSHOE

Batch: B413707

JA

29.0

D35649

Wearshoe



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

WEARSHOE

Batch: B412258

JA

30.0

D35645

Wearshoe



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

WEARSHOE

Batch: B43408

JA

31.0

D25943

O-Ring, 205 Skidtube



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

O-Ring

Batch: B4193T

B 29908

JA

32.0

D25941

Plug, 205 Skidtube



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

Plug

→ REMOVE FROM STOCK, BUFF LIGHTLY

REPAINT OLIVE DRAB GREEN

PLUG Batch: B41434

B M1104476

JA

08-12-02 *ED*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
08-12-02	32.1	11" O" RINGS PART NO: D2594-3 BATCH NO: B29908 QTY: 16 <i>not necessary</i> <i>8/12/03</i>	<i>[Signature]</i>	08-12-02	(X)16		

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Job Number: 43666A

Part Number: D205634041

Job Number:



Seq. #:

Machine Or Operation:

Description :

33.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R Sikaflex-291 M1109942

Sikaflex expire date: 08/11

✓ 2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

✓ 3-Inspect for foreign object per QSI 024

✓ 4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R Sikaflex-291 M11109942

Sikaflex expire date: 08/11

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: M109219

HP 08-12-03 (X)

34.0

QC5

INSPECT WORK TO CURRENT STEP



Sosia 12.3 (X)



Comment: Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

35.0

PACKAGING 1

PACKAGING RESOURCE #1



(X)

Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D205-634-041

Location: PPP

PPP Rev: 43666

8/12/09

Scp

36.0

QC21

FINAL INSPECTION/W/O RELEASE



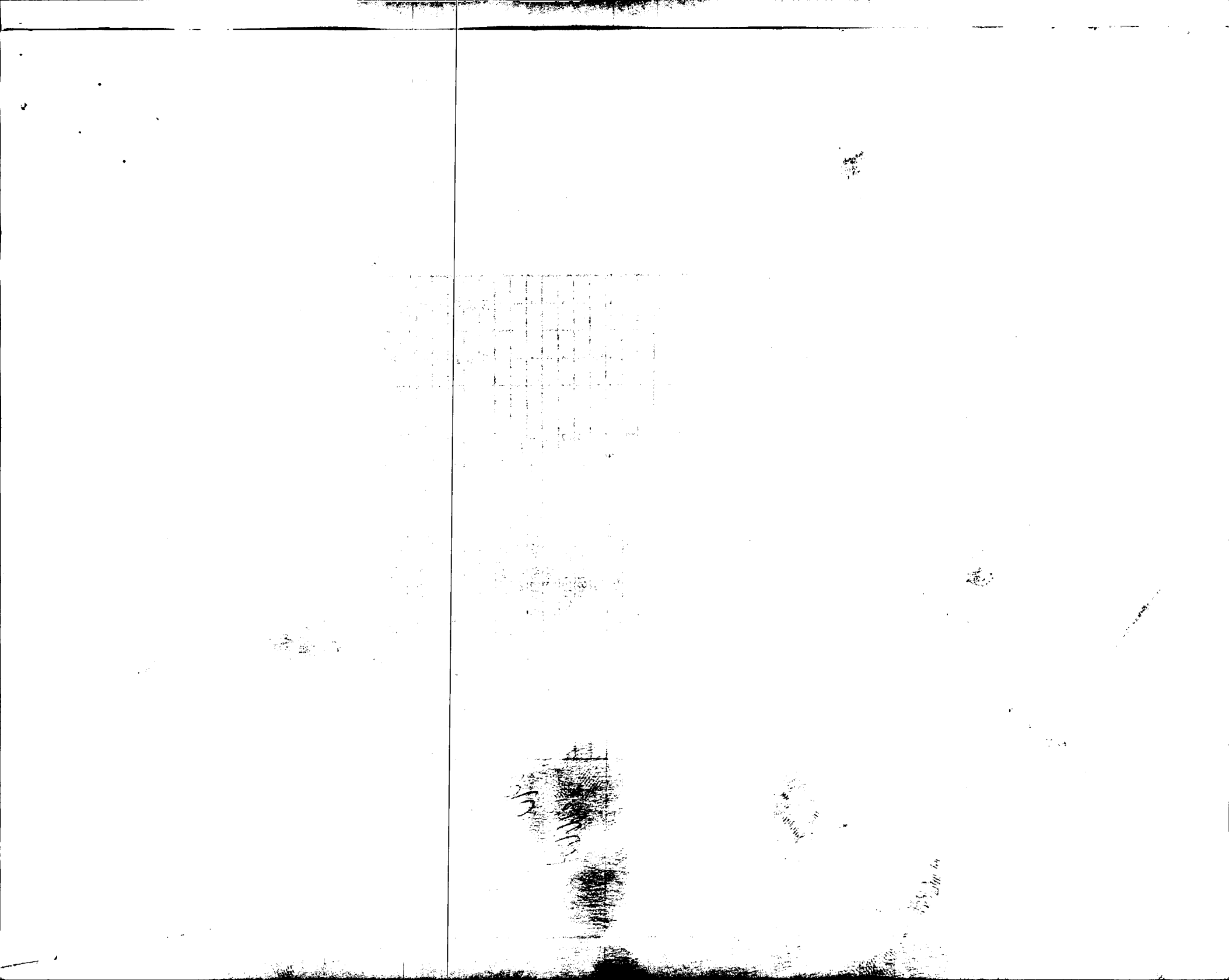
08/12/10 (X)

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



muf 08-12-09



RELEASED
07-06-28

Diagram illustrating the grinding locations for the propeller cross-section:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- LOCATION RIDGE ON UNDERSIDE OF D2576
- $\frac{1}{16}$

Diagram of a wheel assembly with labels: D2579 SPACER, D2596 WEB (REF), ALST-1032-130 (REF) (TYP 50 PLACES), and AFTER PERFORM 1. CHA 2. INS 3. WE 4. C'B.

AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP

i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

[illegible]

D3560-01 ASSEMBLY DETAIL

WELD AS PER DETAIL B

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

0.5 1.5 1.5 D P P P P P P P

8


REFER TO DETAIL C

D3566-1 D3566-5 D3566-1 D3566-13

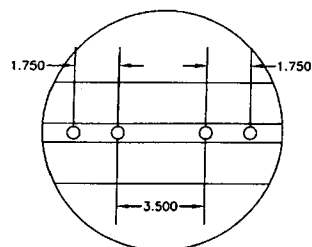
D3564-11 D3564-5 D3564-9 D3564-13

AN3C4A BOLT (1)
AN960C1DL WASHER (1)
(50 PLACES)

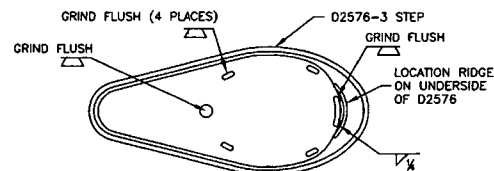
DESIGN	JJ	DRAWN BY	
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	CHECKED	APPROVED		DRAWING NO.	REV. D
				D2580	SHEET 2 OF 3
	DATE	TITLE		SCALE	
07.02.27	205 SKIDTUBE ASSEMBLY		1:24		

DETAIL E
SCALE 5:24

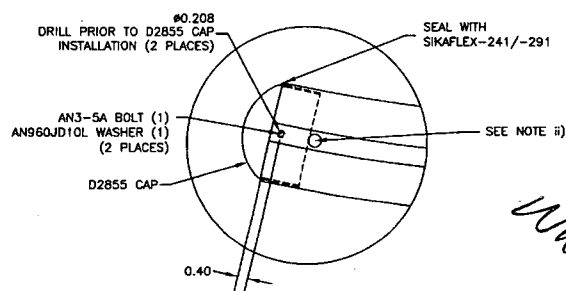


DETAIL F
SCALE 5:24

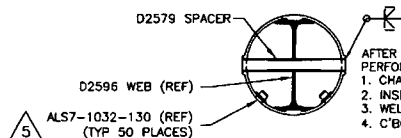


RELEASED
07 Dec 18

DETAIL G
SCALE 5:24

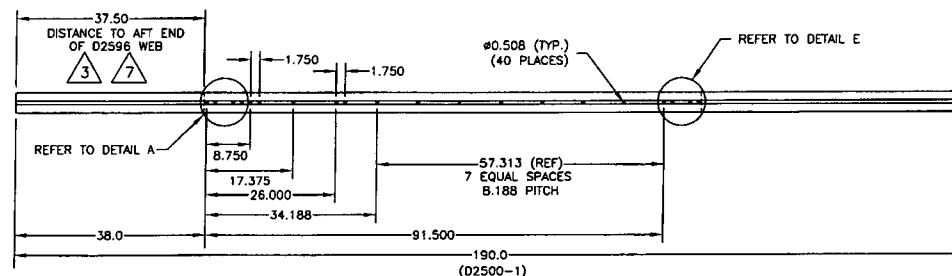


SECTION H-H
SCALE 5:24

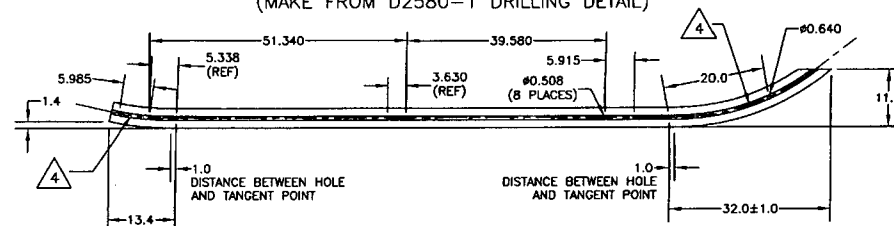


- AFTER DRILLING AND BENDING ASSEMBLY PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:
1. CHAMFER HOLE 0.050 X 45°
 2. INSERT D2579 SPACER (20 PLACES)
 3. WELD INTO PLACE AND GRIND FLUSH
 4. C'BORE D2579 SPACER TO #0.437 X 1.00 DEEP

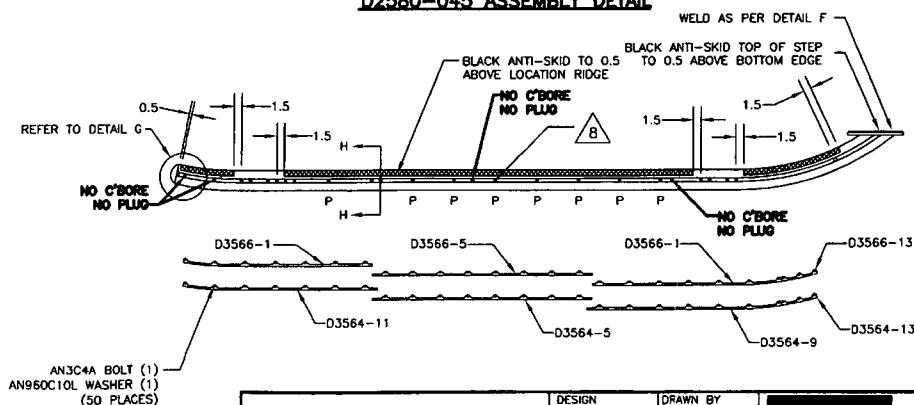
D2580-1 DRILLING DETAIL



D2580-5 BENDING AND CUTTING DETAIL
(MAKE FROM D2580-1 DRILLING DETAIL)



D2580-045 ASSEMBLY DETAIL



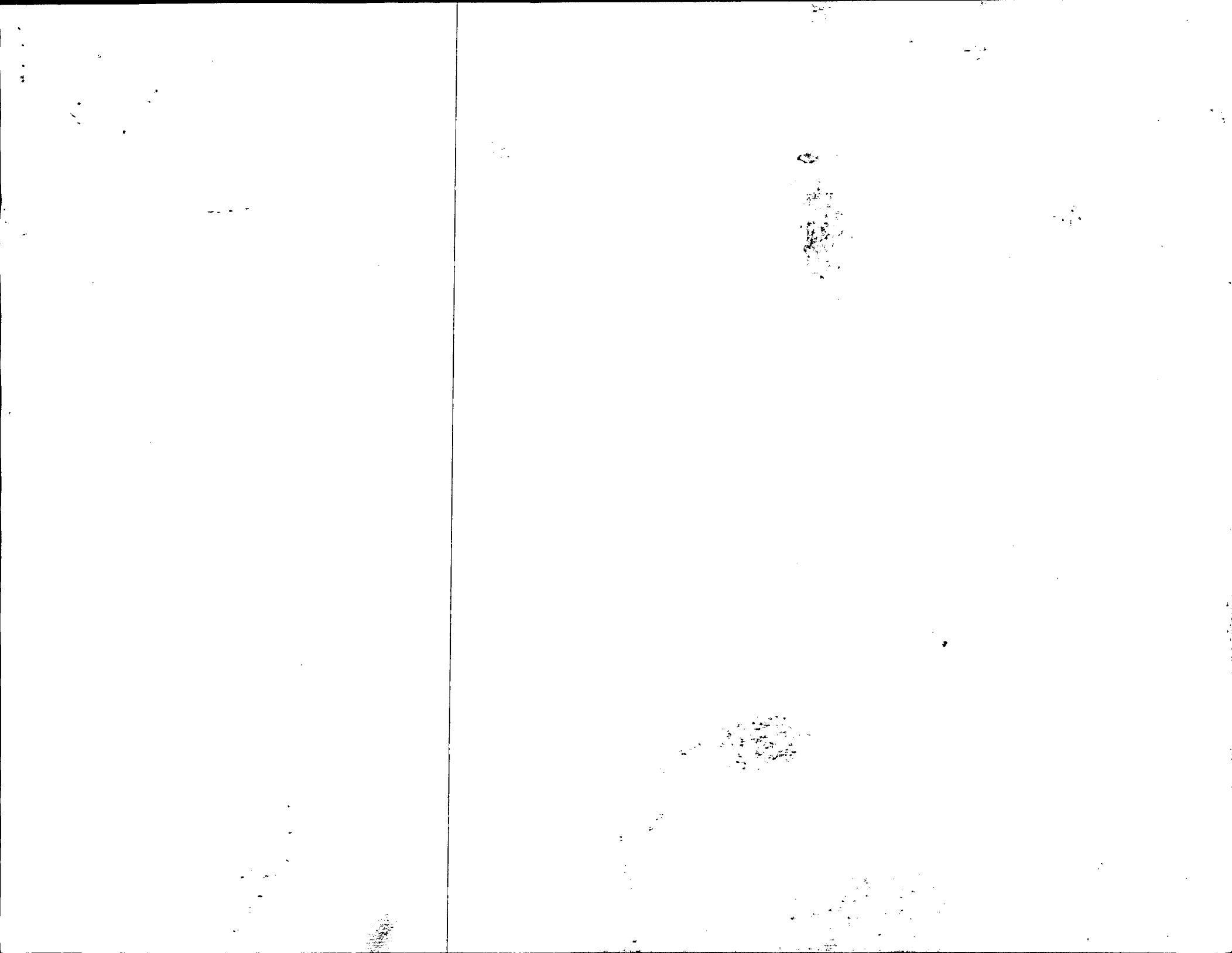
D2580-045 NOTES

- FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

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DESIGN PH	DRAWN BY PH	DART DART AEROSPACE LTD. HAMMERSLEY, ONTARIO, CANADA	REV. 0
CHECKED H	APPROVED H	DRAWING NO. D2580	SHEET 3 OF 3
DATE 07.02.27	TITLE 205 SKIDTUBE ASSEMBLY	SCALE 1:24	



NO. 182

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliot
Job number: B43240 A
Part number: 1205 64 041
Description: 205 Skid tube
Welding Process: Tig[☒] Mig[]
Base material: Alum.
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier David Dewal Date of Test Coupon 08/11/20

Welder Barclay Elliot Date of Test Coupon 08/11/20

The above named individual is qualified in accordance with AWS D17.1.2001 to weld

Date: Tuesday, 02/12/2008 11:23:32 AM
 User: Melanie Fauteux

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: SKID TUBE ASSEMBLY
Job Number	: 43666A		
Estimate Number	: 10023		
P.O. Number	:	Part Number	: D205634041
This Issue	: 02/12/2008	S.O. No.	:
Prsht Rev.	: NC	Drawing Number	: D2580 REV D
First Issue	: 21/11/2008	Project Number	: N/A
Previous Run	: 43585	Drawing Revision	: D
	Type	Material	:
	: SKIDTUBES	Due Date	: 05/12/2008
Written By	:	Qty:	1
Checked & Approved By	: <u>MF 08-12-02</u>	Um:	Each
Comment	: Est Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ Est Rev: O 06.02.28 Added paperwork EC Est Rev:P 07-07-09 SS Wearplates & Gaskets JLM		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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16.0	POWDER COATING	POWDER COATING
------	----------------	----------------



Comment: POWDER COATING
 Powder Coat OLIVE DRAB GREEN

START TIME: _____
 OVEN TEMPERATURE: _____
 FINISH TIME: _____

Job Completion

